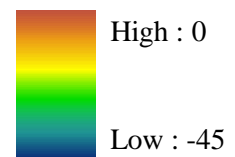


Legend

Hugo regions

- Lacusterrine
- Riverine
- Transitional

Hugo water depth (ft)



Major rivers

- # AG stations
- X OKCC stations
- G OWRB stations
- " Legacy STORET
- (Recent STORET

Illinois River Project

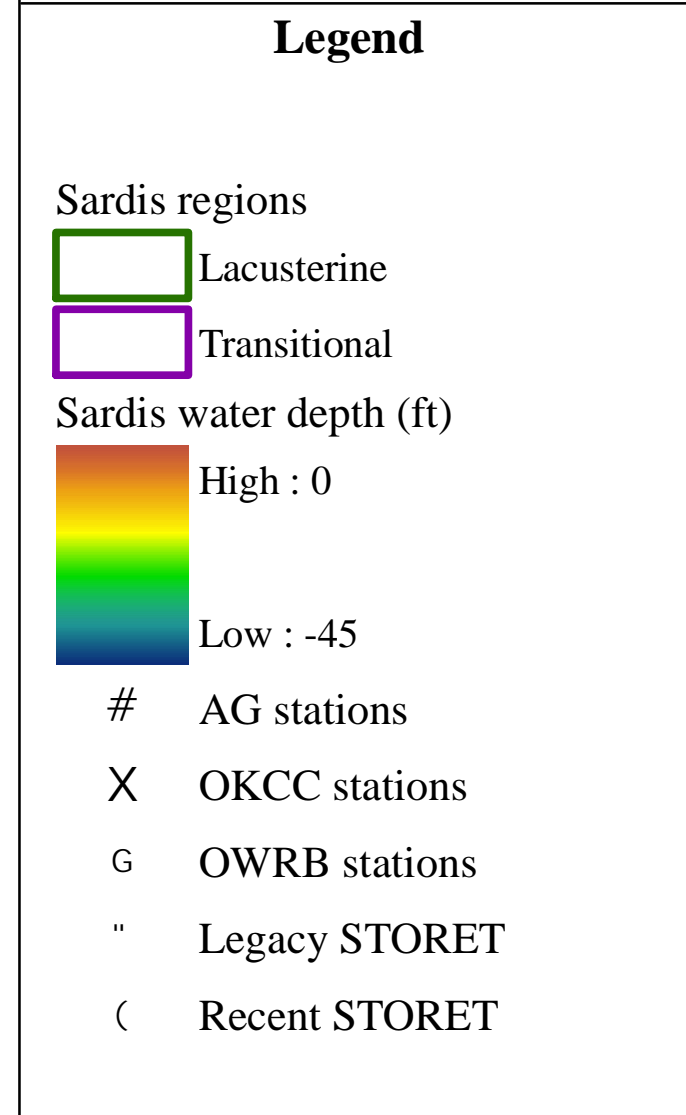
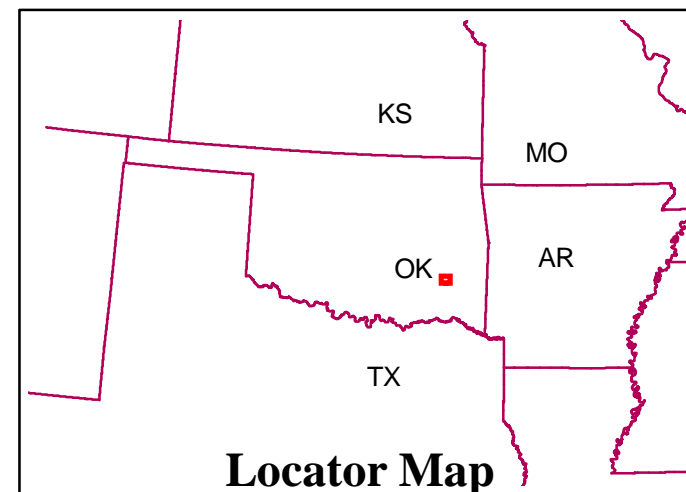
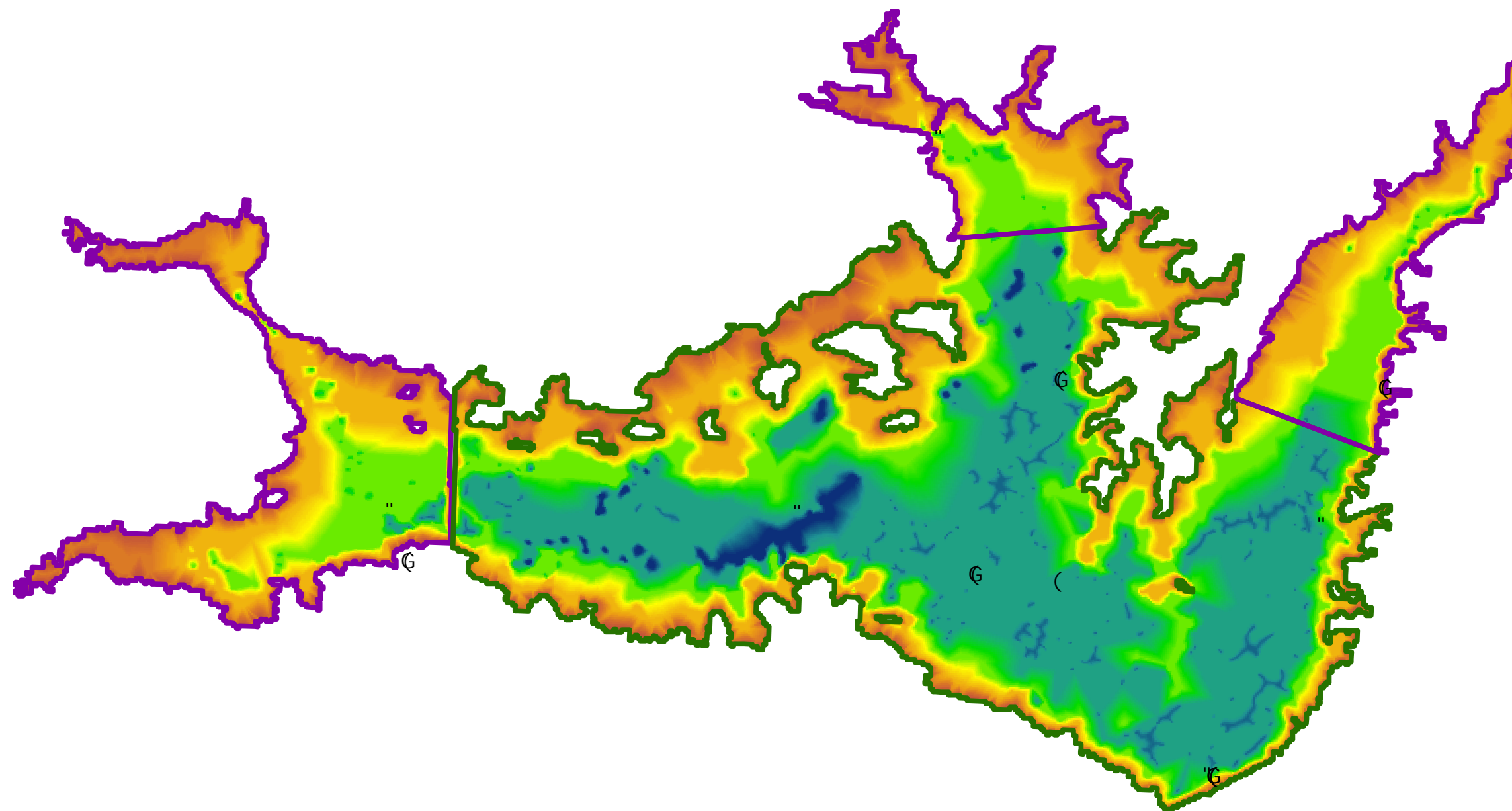
Figure 2-18a.

Water depths for Lake Hugo.



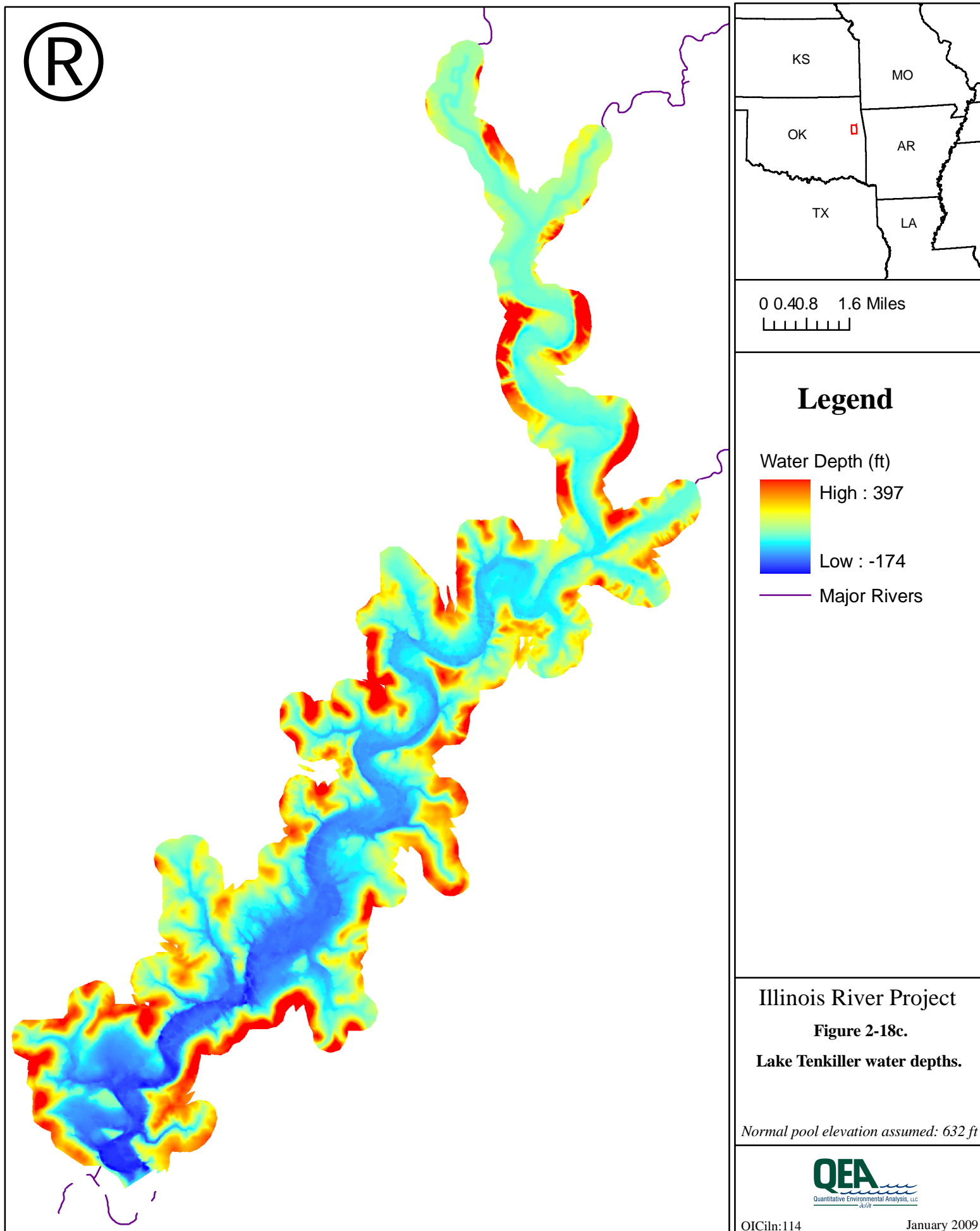
OICiln:114

January 2009



Illinois River Project

Figure 2-18b.
Water depths for Lake Sardis.



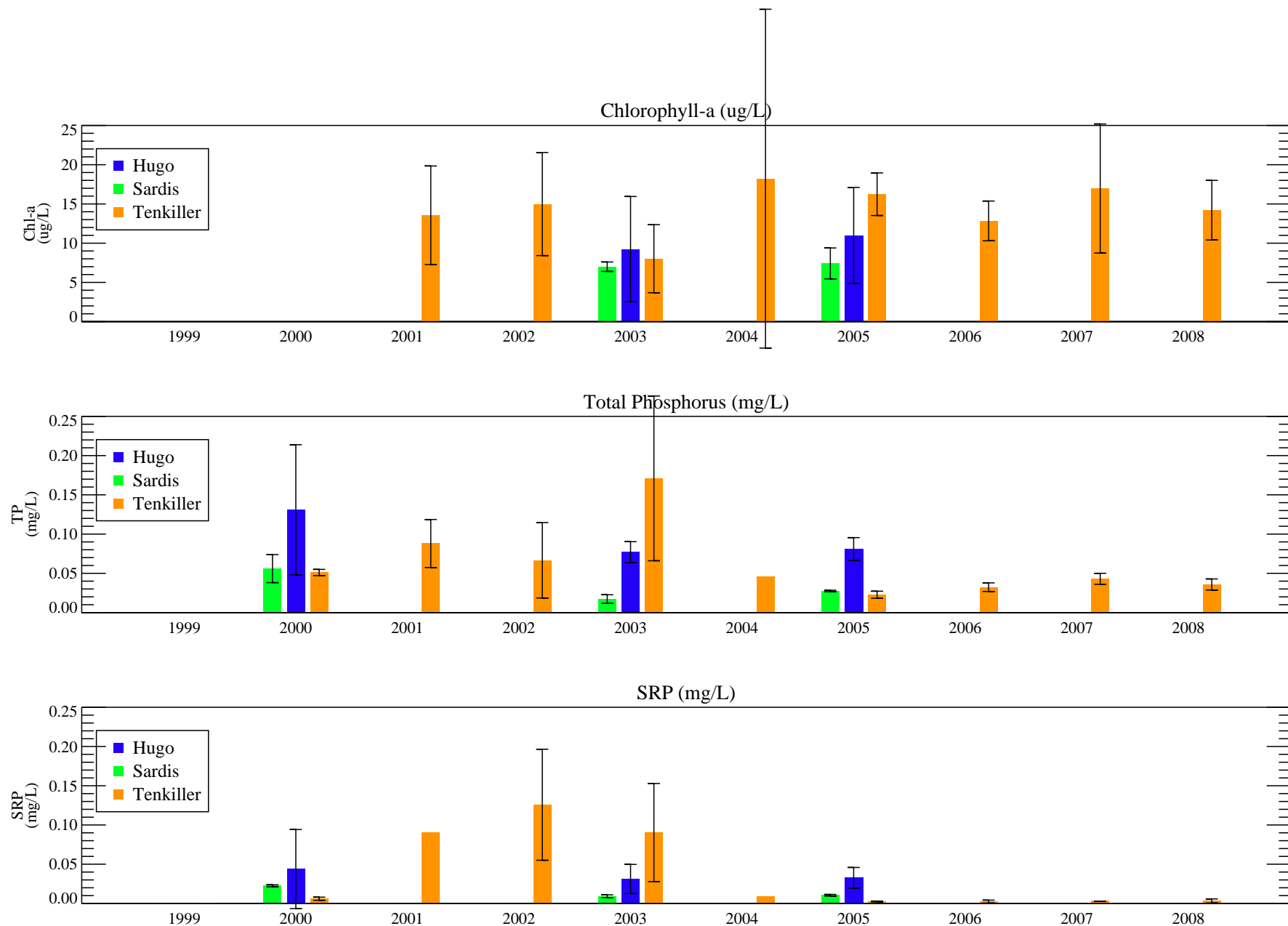


Figure 2-19. Comparative watershed transitional section average summer surface (< 3.5 m) chlorophyll-a, total phosphorus, and SRP concentrations.

Data sources are EPA legacy and recent STORET, OWRB, OKCC, Plaintiffs' Database 2004 to 2008, and USACE.

Only data collected during summer months (May through September) used for the analysis.

Non-detects are excluded.

Error bars are at +/- 2 standard errors.

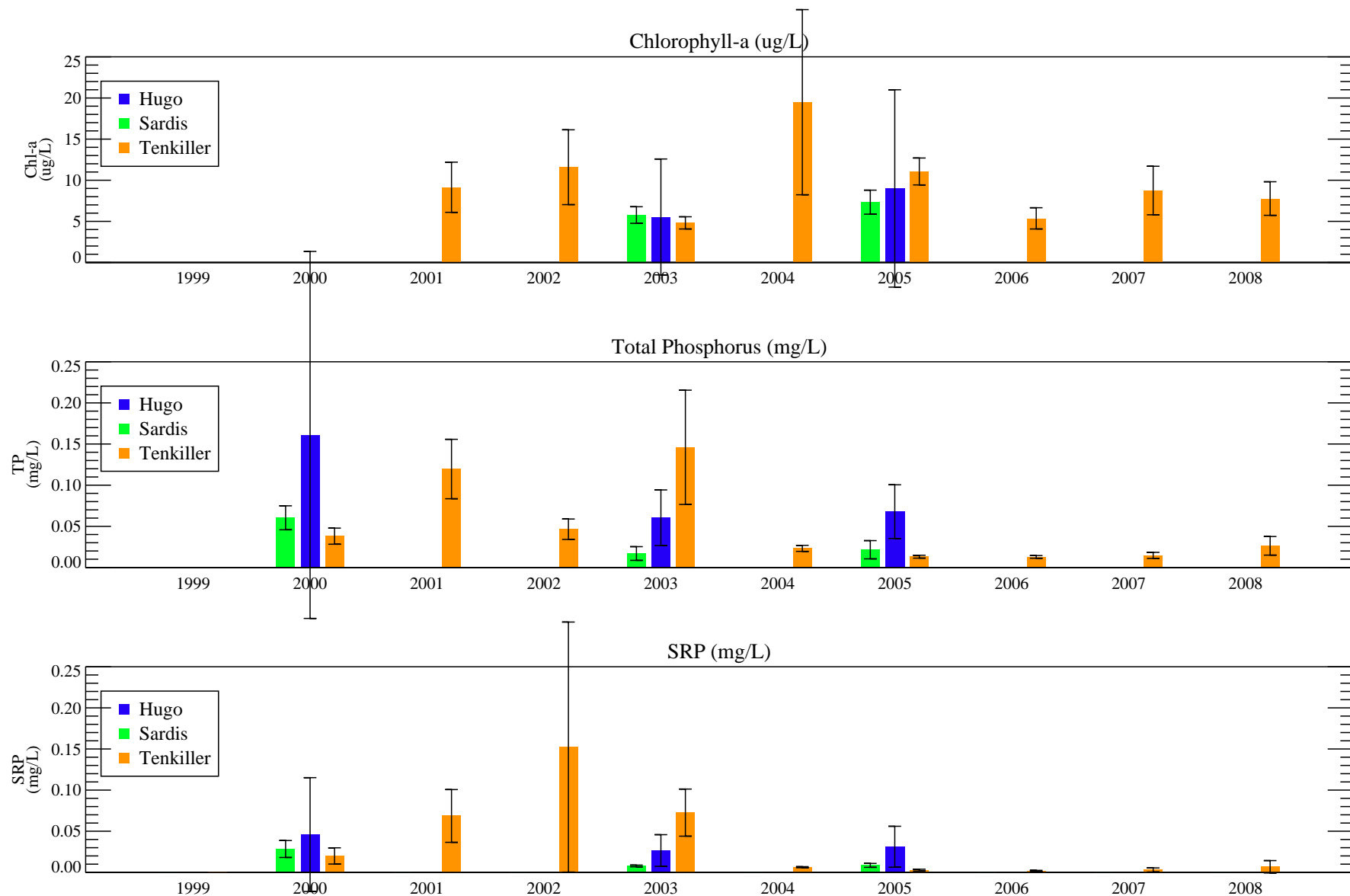


Figure 2-20. Comparative watershed lacustrine section average summer surface (< 3.5 m) chlorophyll-a, total phosphorus, and SRP concentrations.

Data sources are EPA legacy and recent STORET, OWRB, OKCC, Plaintiffs' Database 2004 to 2008, and USACE.

Only data collected during summer months (May through September) used for the analysis.

Non-detects are excluded.

Error bars are at +/- 2 standard errors.

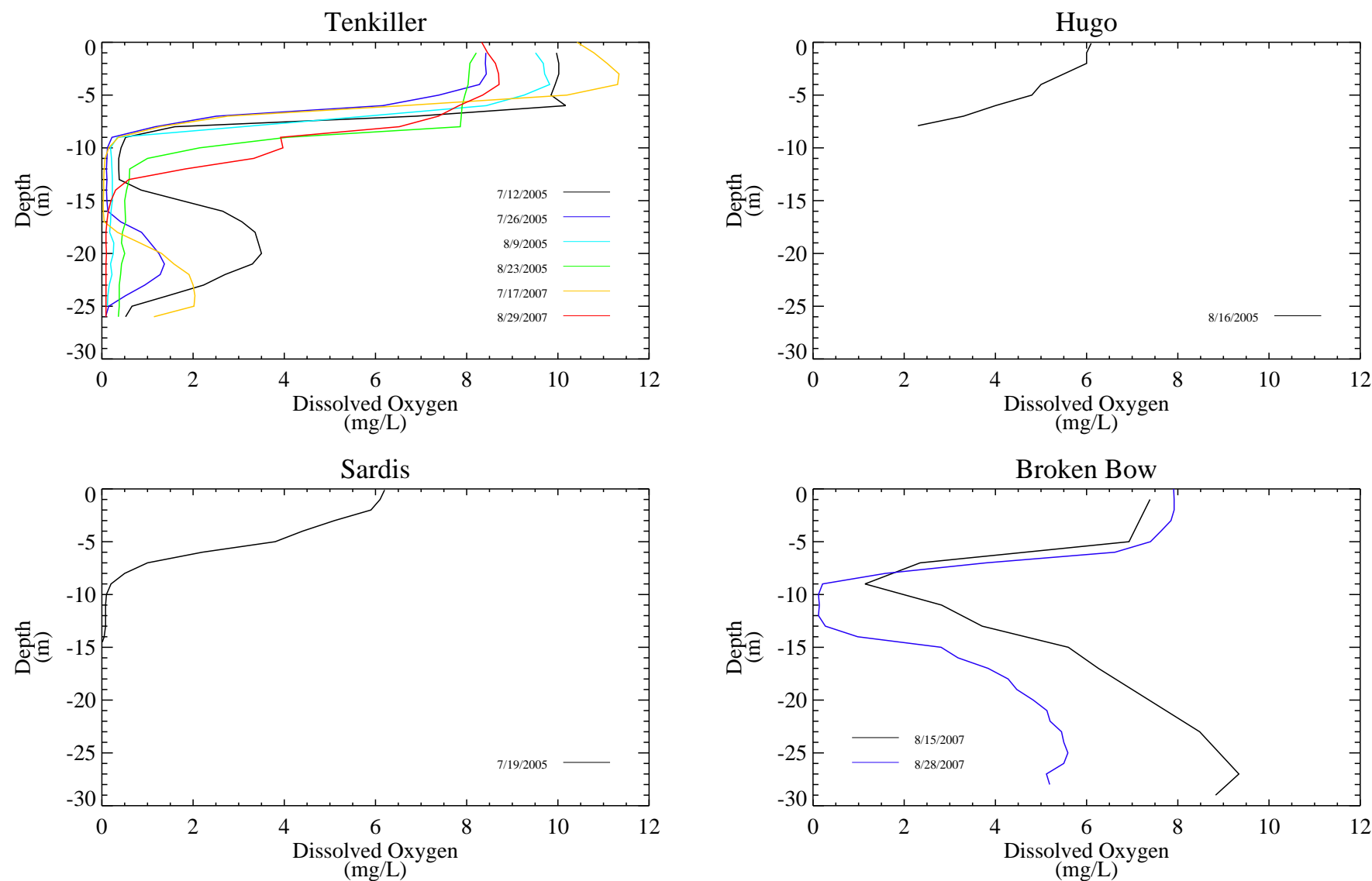


Figure 2-21. Lacustrine dissolved oxygen profiles for Lakes Tenkiller, Hugo, Sardis, and Broken Bow.

Data sources are Plaintiffs' Database 2004 to 2008 (Lakes Tenkiller and Broken Bow) and OWRB BUMP (Lakes Hugo and Sardis). July and August 2005 and 2007 Lake Tenkiller profiles chosen to correspond with available comparative lake profile dates.

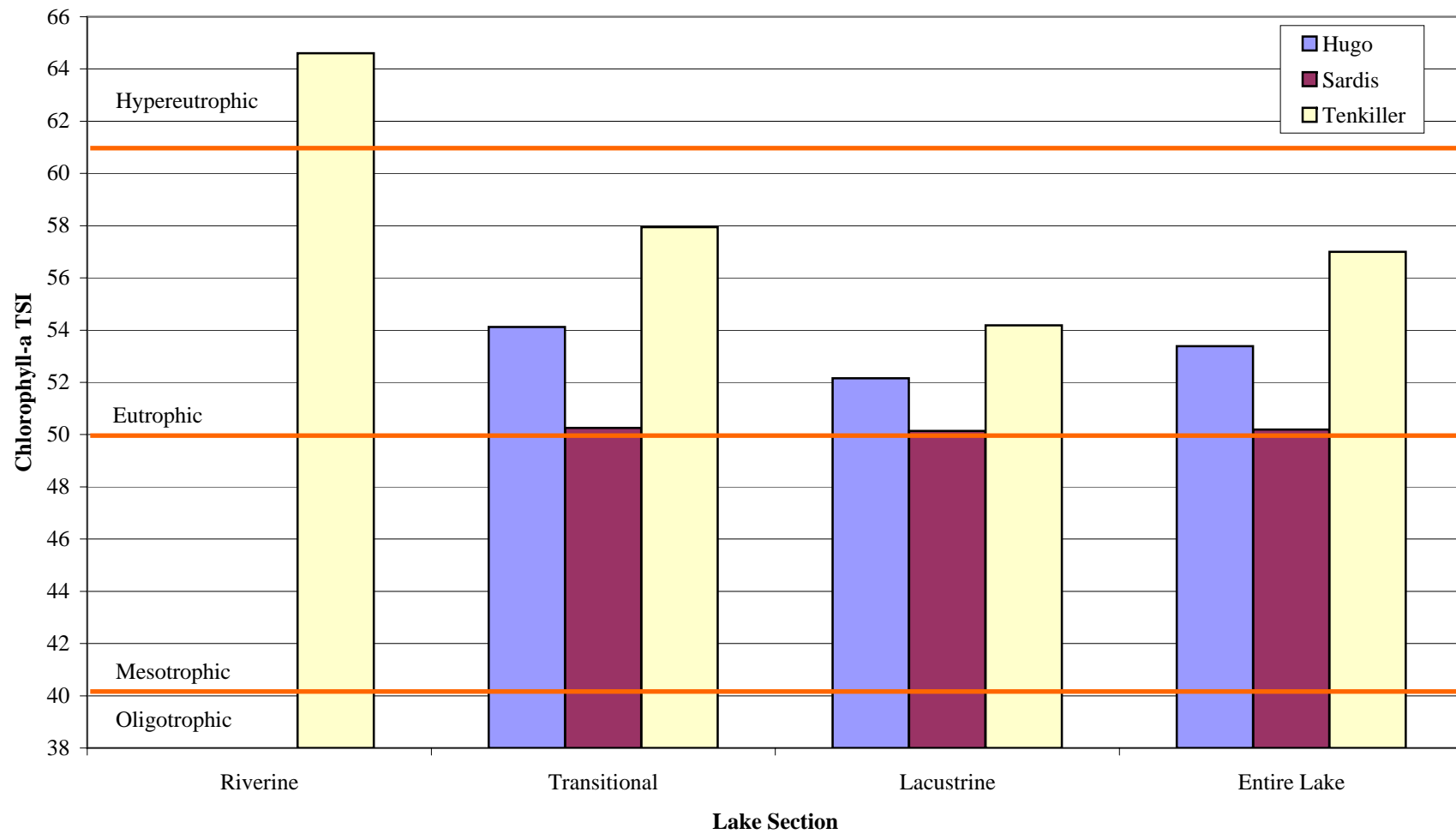


Figure 2-22. 2005 summer surface (< 3.5m) chlorophyll-a TSI values for lakes Hugo, Sardis, and Tenkiller.

Data sources: EPA recent STORET, OWRB, OKCC, Plaintiffs' Database 2004 to 2008, and USACE

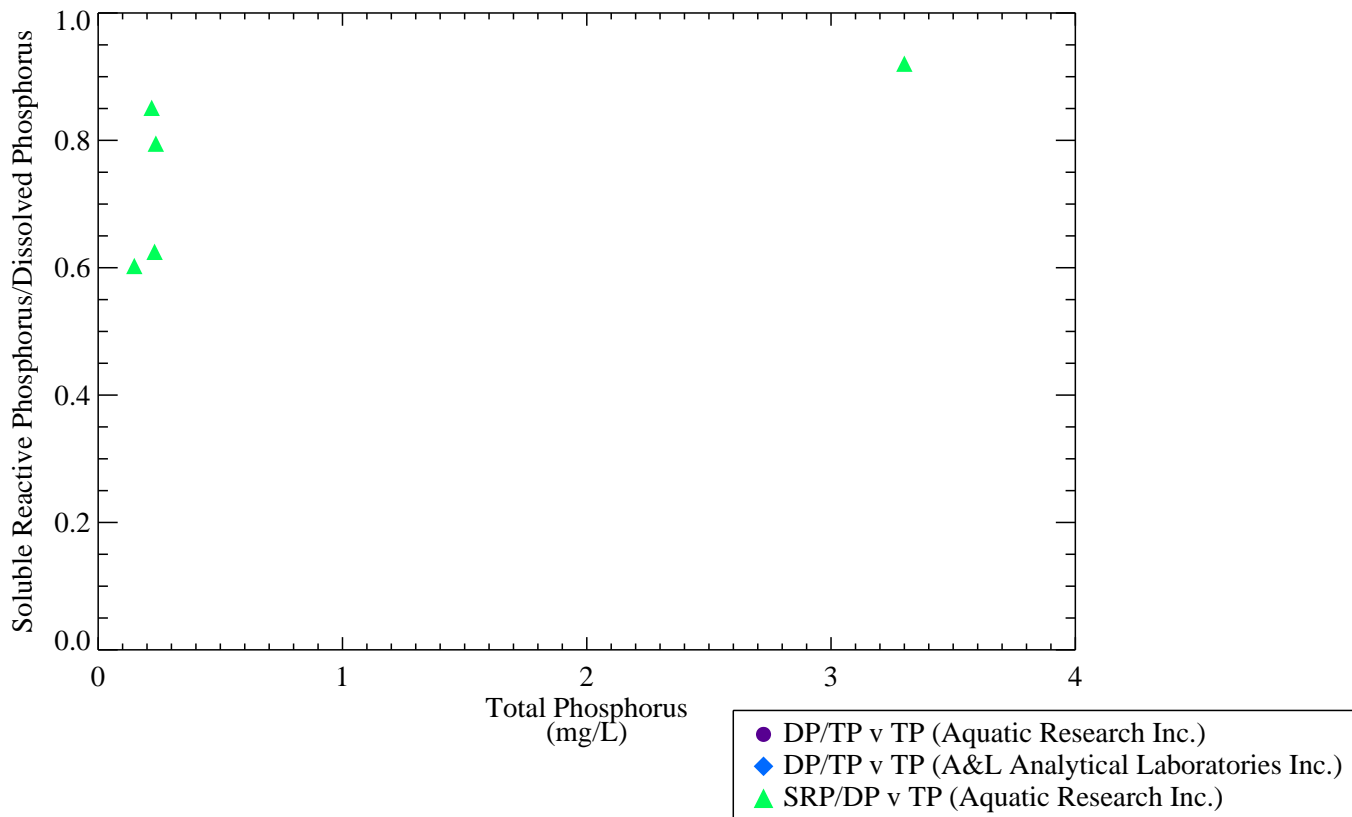
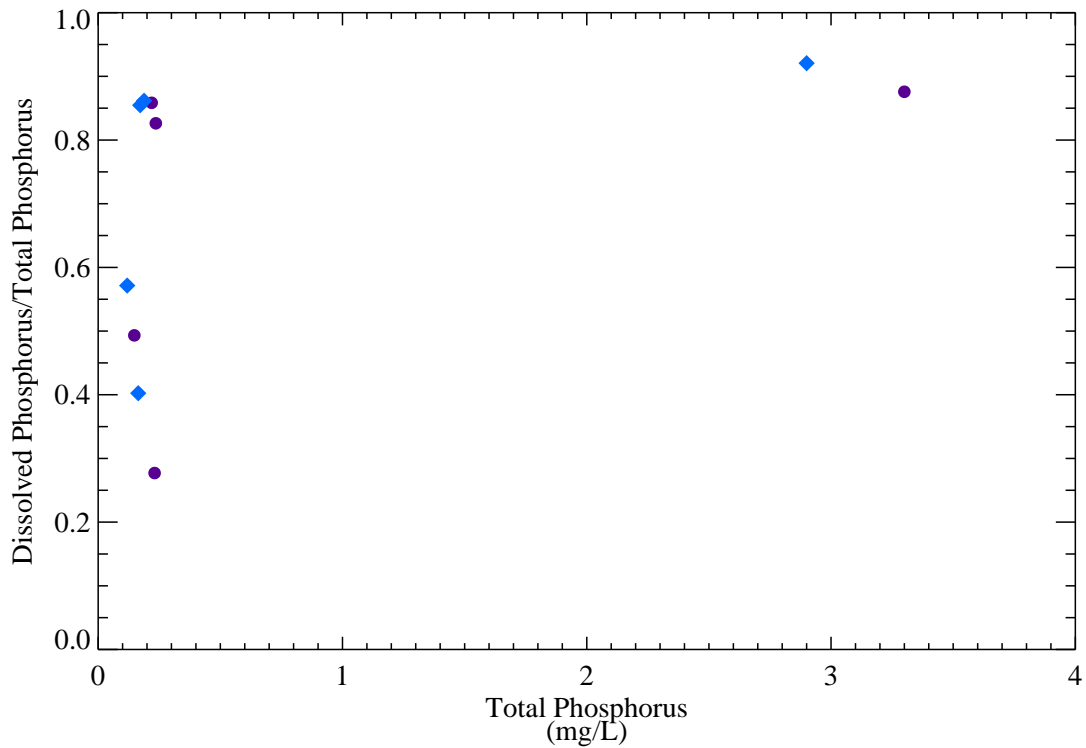
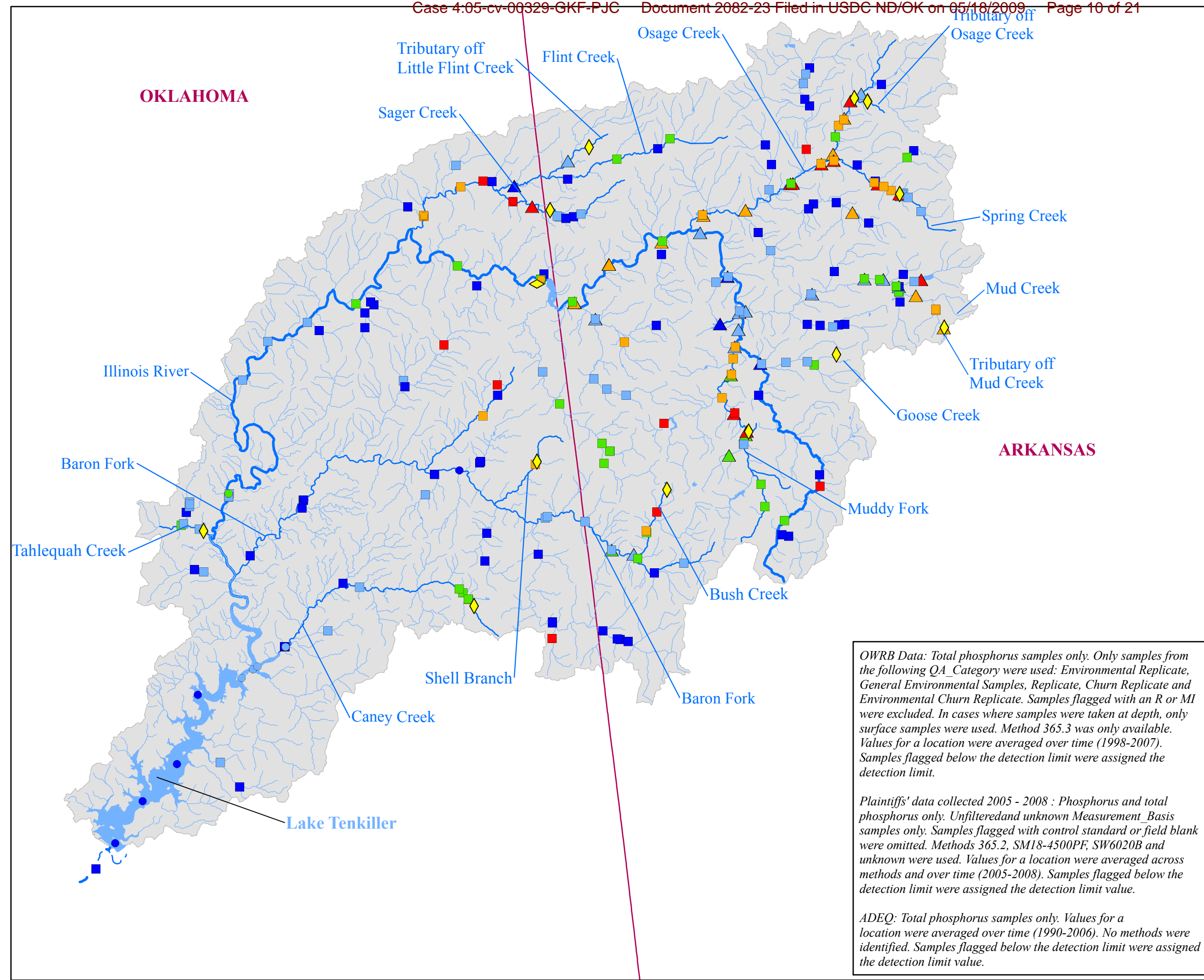


Figure 2-23. Soluble reactive phosphorus/dissolved phosphorus or dissolved phosphorus/total phosphorus vs. total phosphorus at wastewater treatment plants.

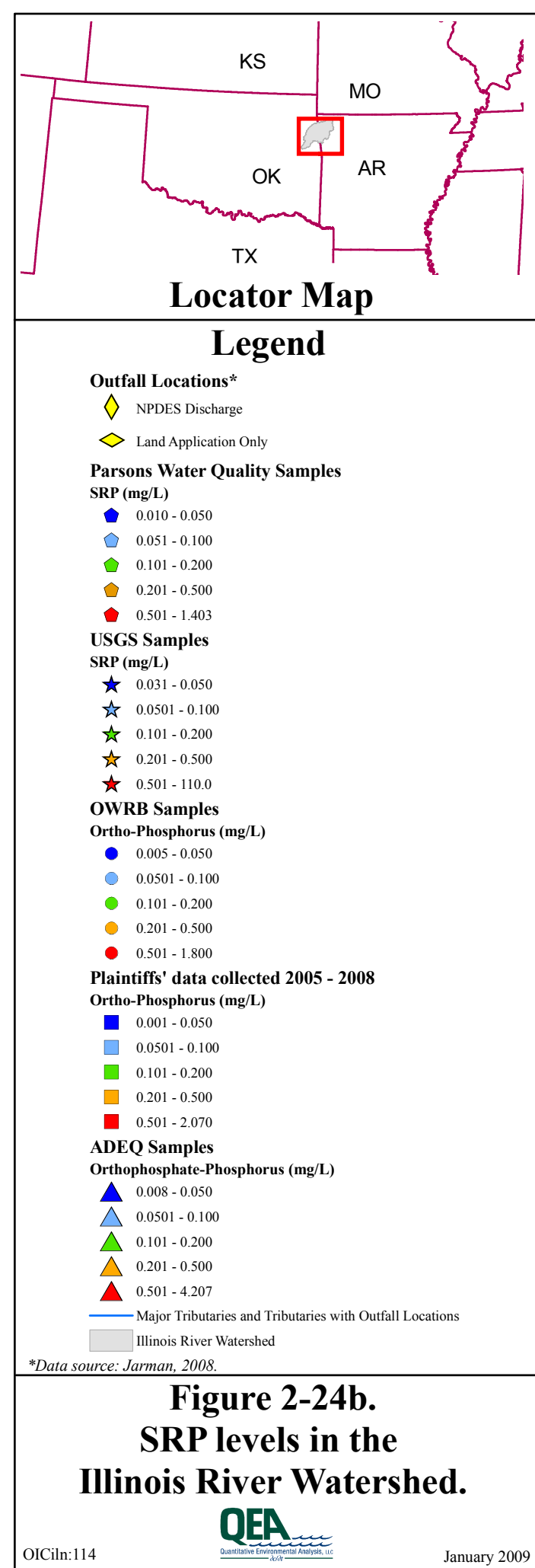
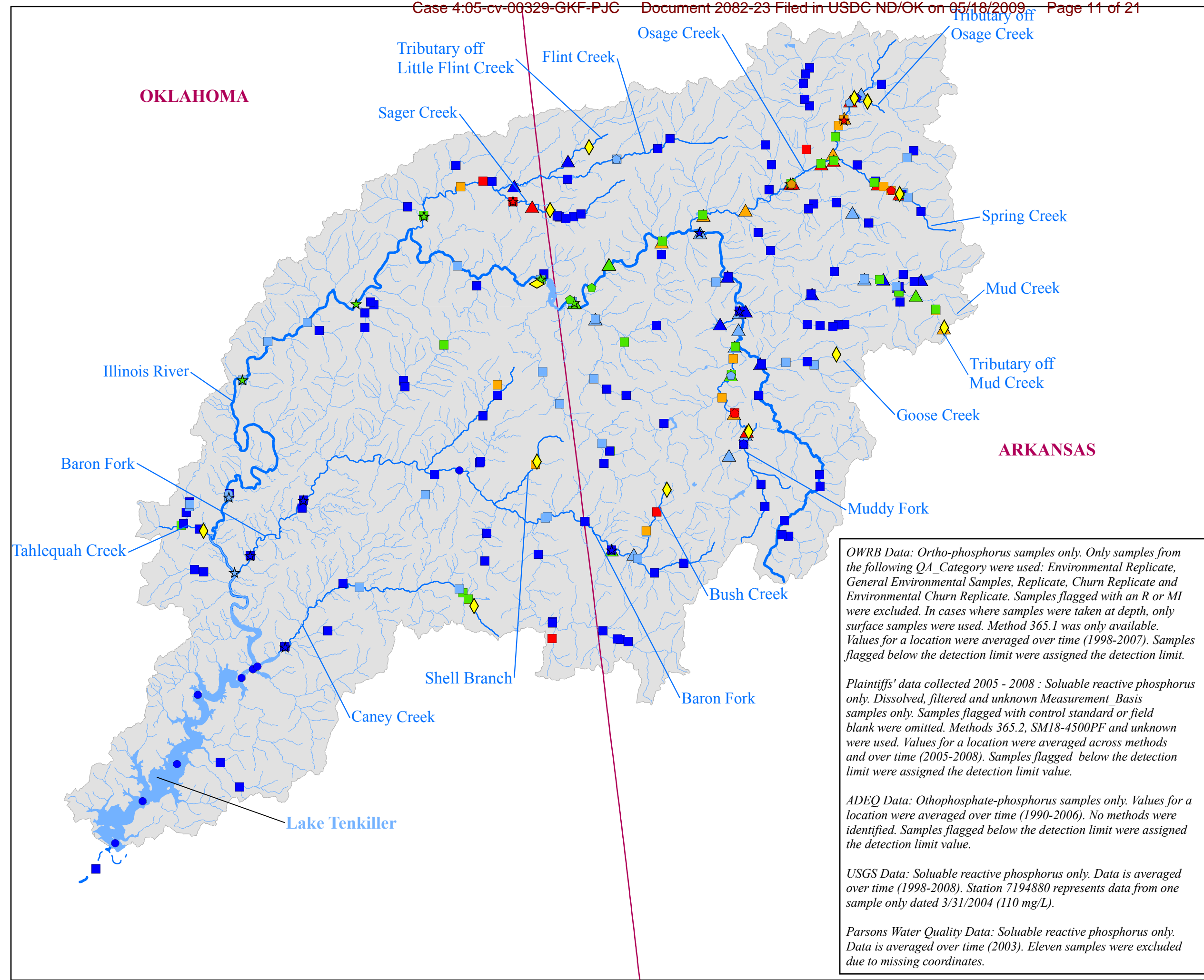
Data source: Plaintiff's Database



*Data source: Jarman, 2008.

Figure 2-24a.
Total phosphorus levels in the
Illinois River Watershed.





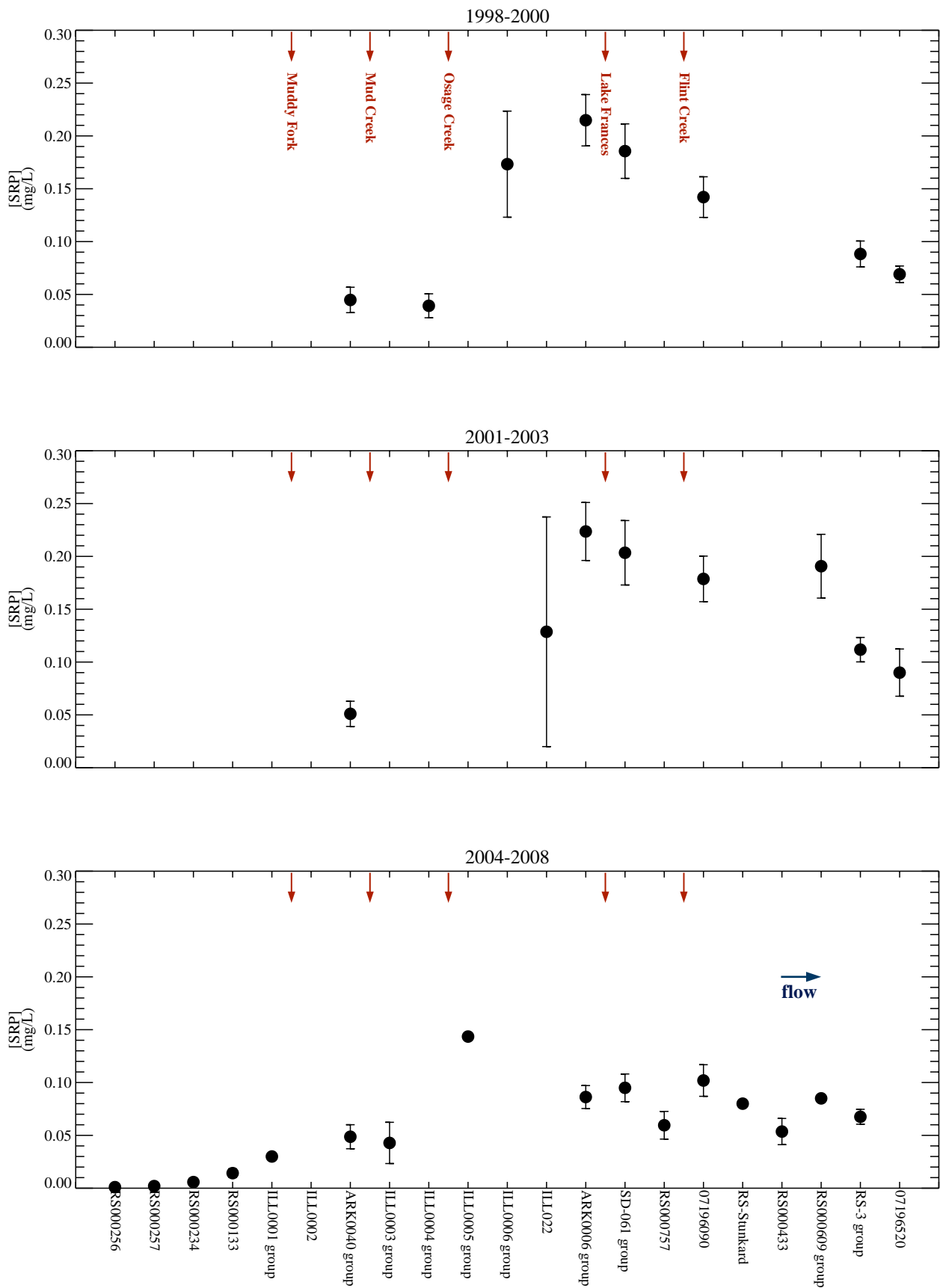
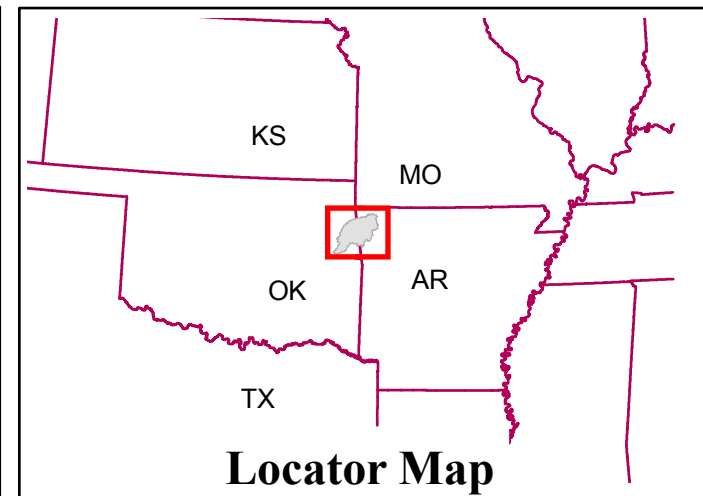
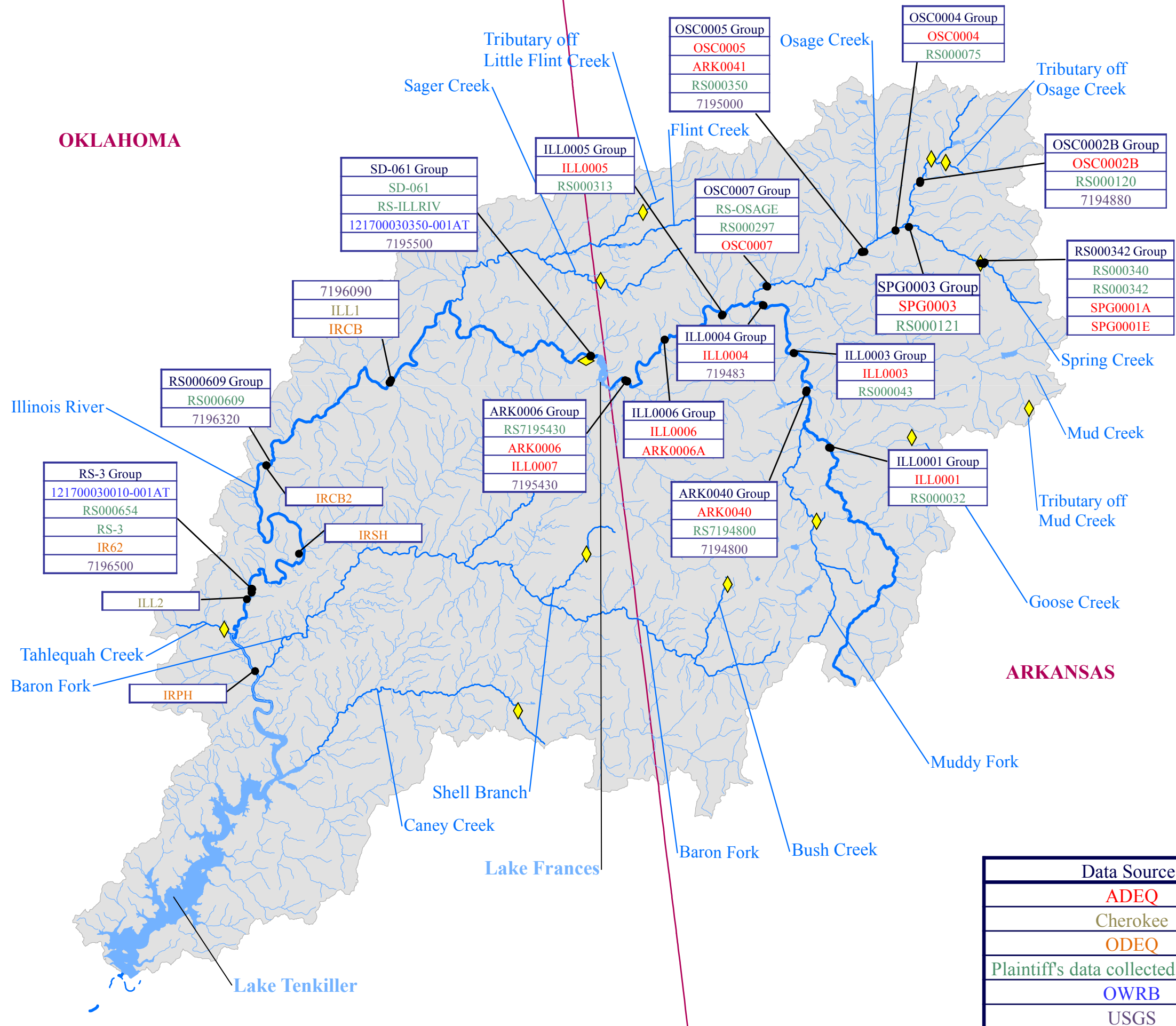


Figure 2-25. Soluble reactive phosphorus (SRP), Illinois River.

Sources: Plaintiff data collected 2005-2008, OWRB, ADEQ, Parsons, and USGS.

Symbols indicate mean +/- two standard errors. Results below detection limit included at the detection limit. Closely located stations from differing sampling plans are grouped. Distance between stations not to scale. Sample RS-234-032707 from station RS000234 was excluded because it was an outlier at $P > 0.00001$ (using Grubbs test.)



Legend

Outfall locations*

- NPDES Discharge
- Land Application Only

Illinois River

Major tributaries and tributaries with outfall locations

Illinois River Watershed

*Data source: Jarman, 2008.

Figure 2-26.
Data sources for station groupings in the Illinois River Watershed.

Data Sources
ADEQ
Cherokee
ODEQ
Plaintiff's data collected 2005 - 2008
OWRB
USGS

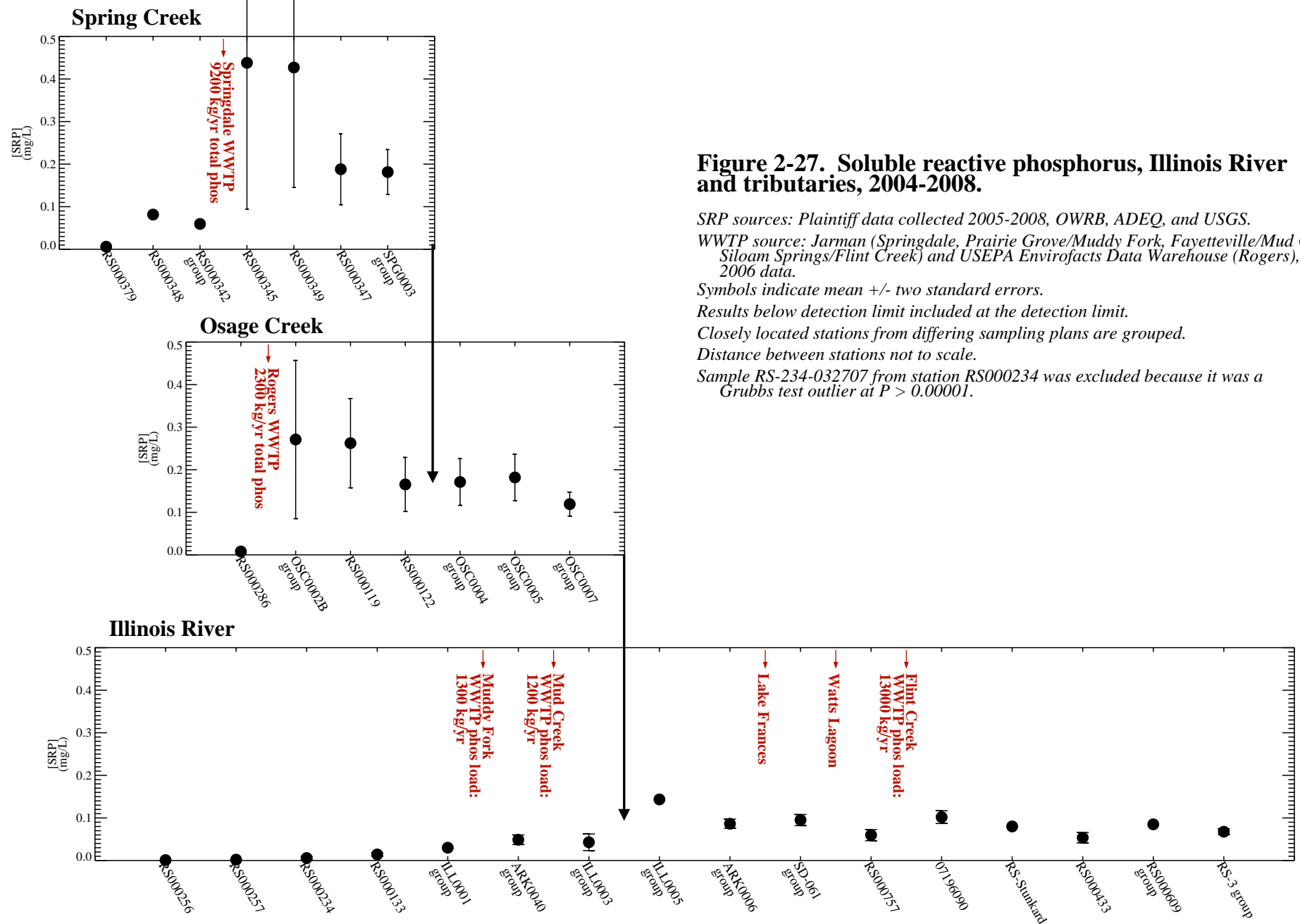


Figure 2-27. Soluble reactive phosphorus, Illinois River and tributaries, 2004-2008.

SRP sources: Plaintiff data collected 2005-2008, OWRB, ADEQ, and USGS.

WWTP source: Jarman (Springdale, Prairie Grove/Muddy Fork, Fayetteville/Mud Creek, Siloam Springs/Flint Creek) and USEPA Envirofacts Data Warehouse (Rogers), 2006 data.

Symbols indicate mean +/- two standard errors.

Results below detection limit included at the detection limit.

Closely located stations from differing sampling plans are grouped.

Distance between stations not to scale.

Sample RS-234-032707 from station RS000234 was excluded because it was a Grubbs test outlier at $P > 0.00001$.

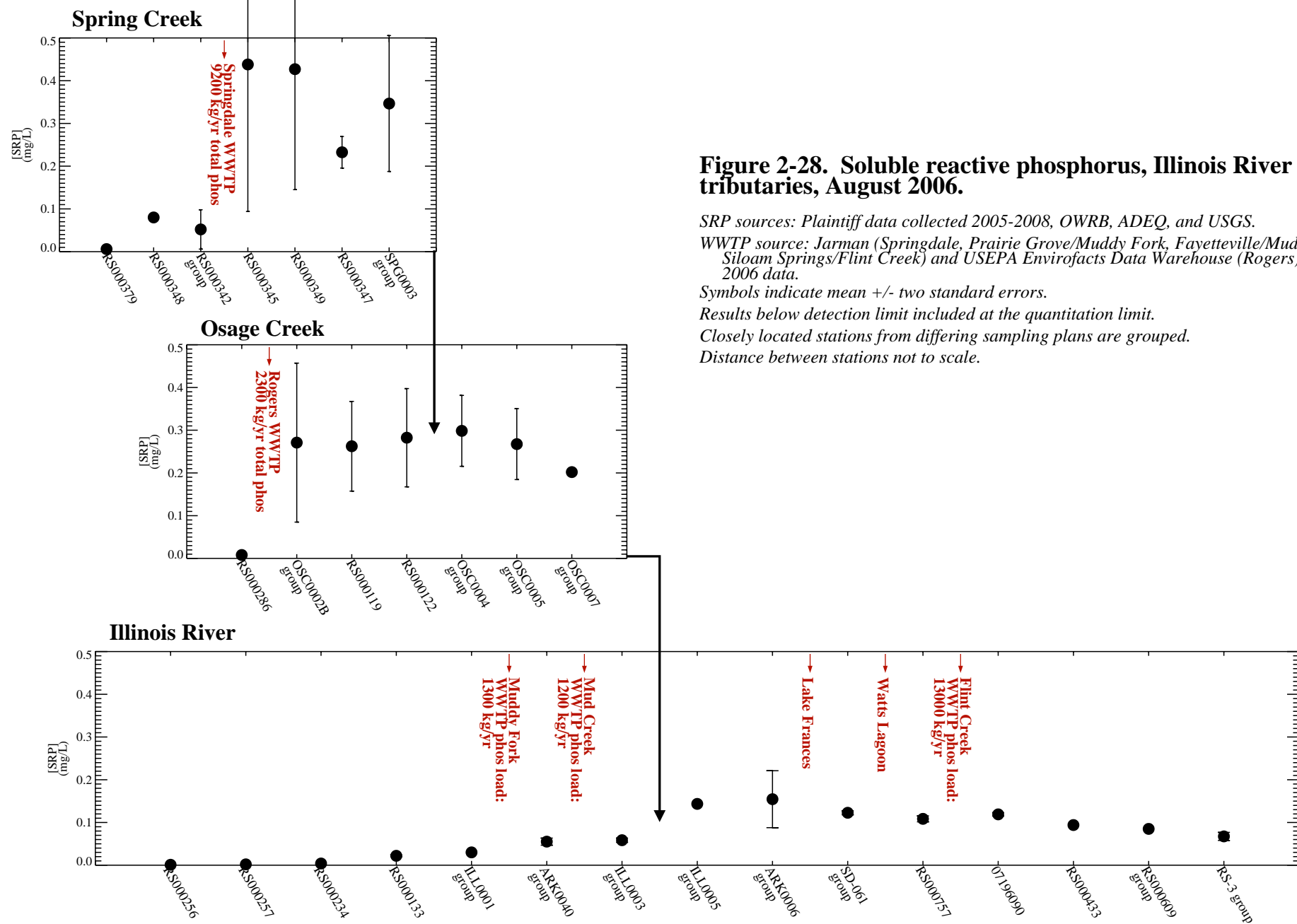


Figure 2-28. Soluble reactive phosphorus, Illinois River and tributaries, August 2006.

SRP sources: Plaintiff data collected 2005-2008, OWRB, ADEQ, and USGS.

WWTP source: Jarman (Springdale, Prairie Grove/Muddy Fork, Fayetteville/Mud Creek, Siloam Springs/Flint Creek) and USEPA Envirofacts Data Warehouse (Rogers), 2006 data.

Symbols indicate mean +/- two standard errors.

Results below detection limit included at the quantitation limit.

Closely located stations from differing sampling plans are grouped.

Distance between stations not to scale.

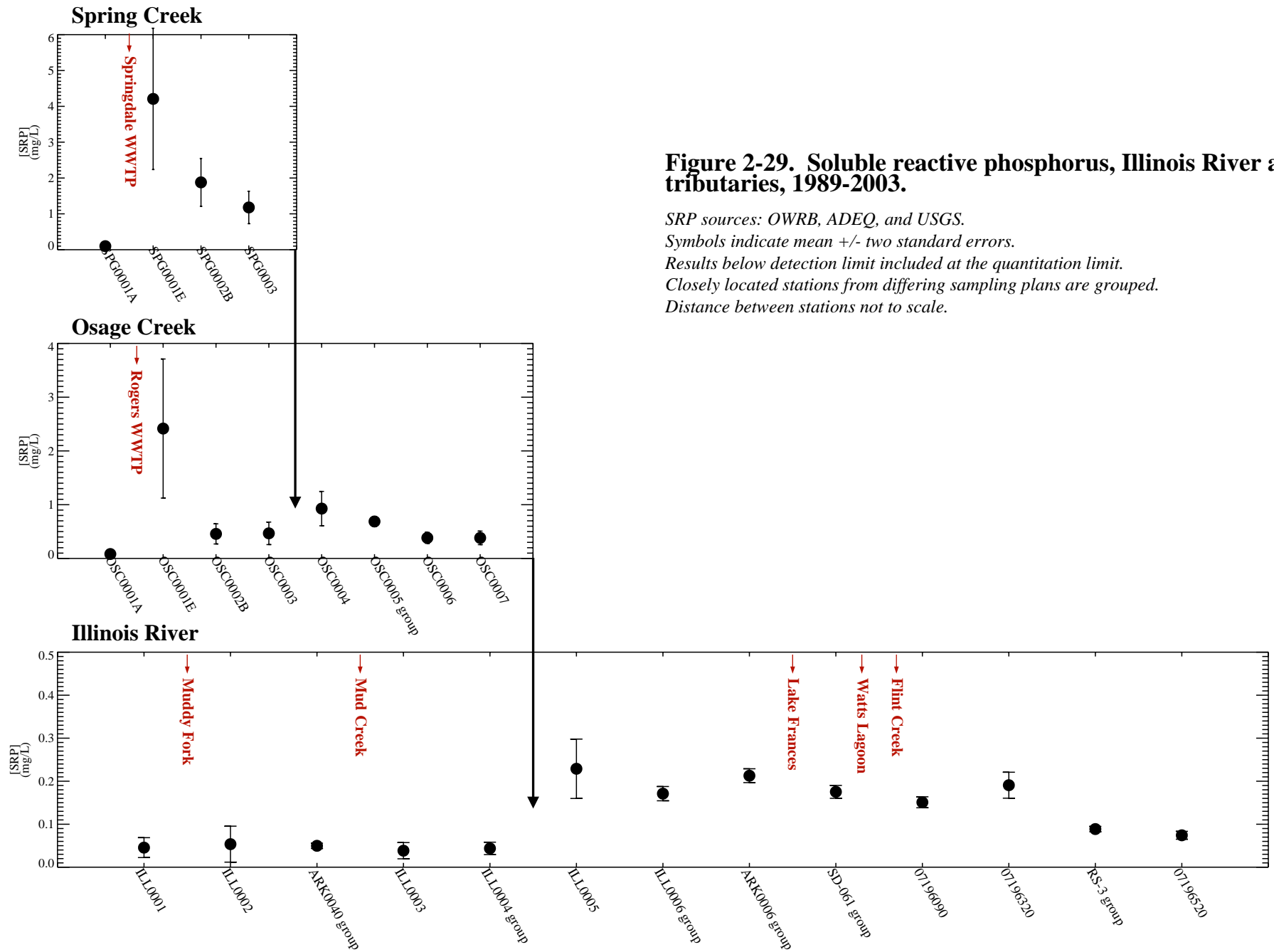


Figure 2-29. Soluble reactive phosphorus, Illinois River and tributaries, 1989-2003.

SRP sources: OWRB, ADEQ, and USGS.

Symbols indicate mean \pm two standard errors.

Results below detection limit included at the quantitation limit.

Closely located stations from differing sampling plans are grouped.

Distance between stations not to scale.

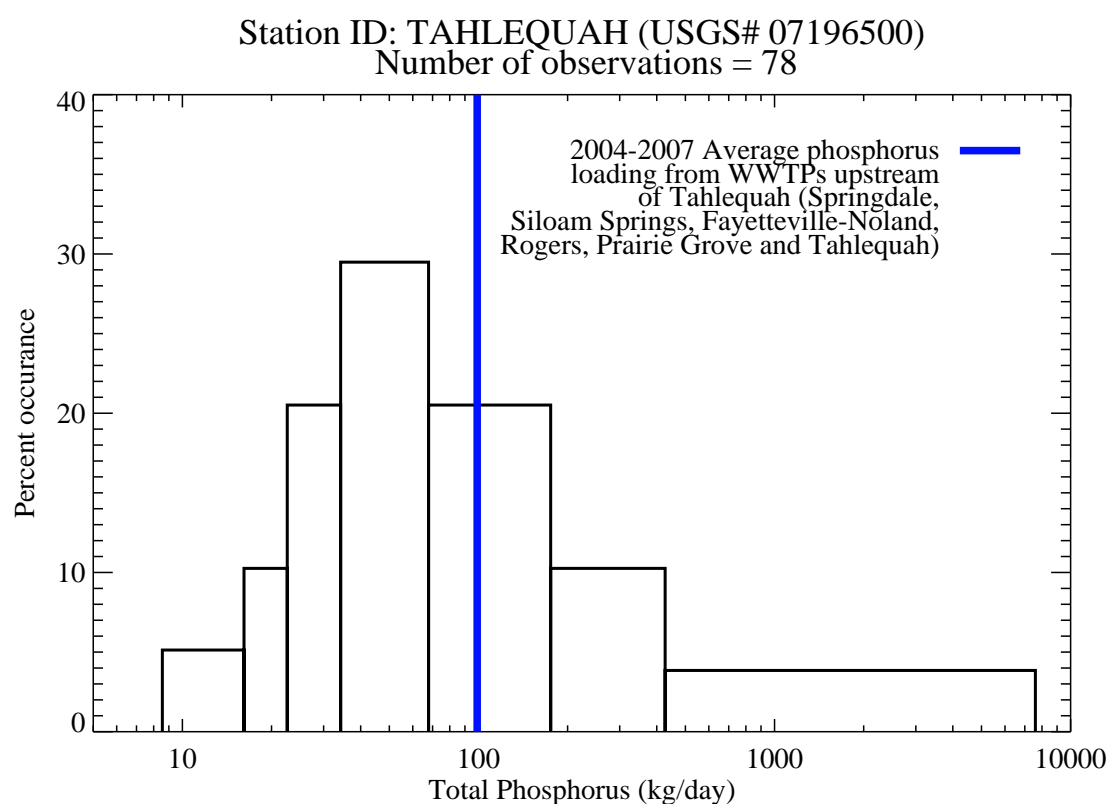
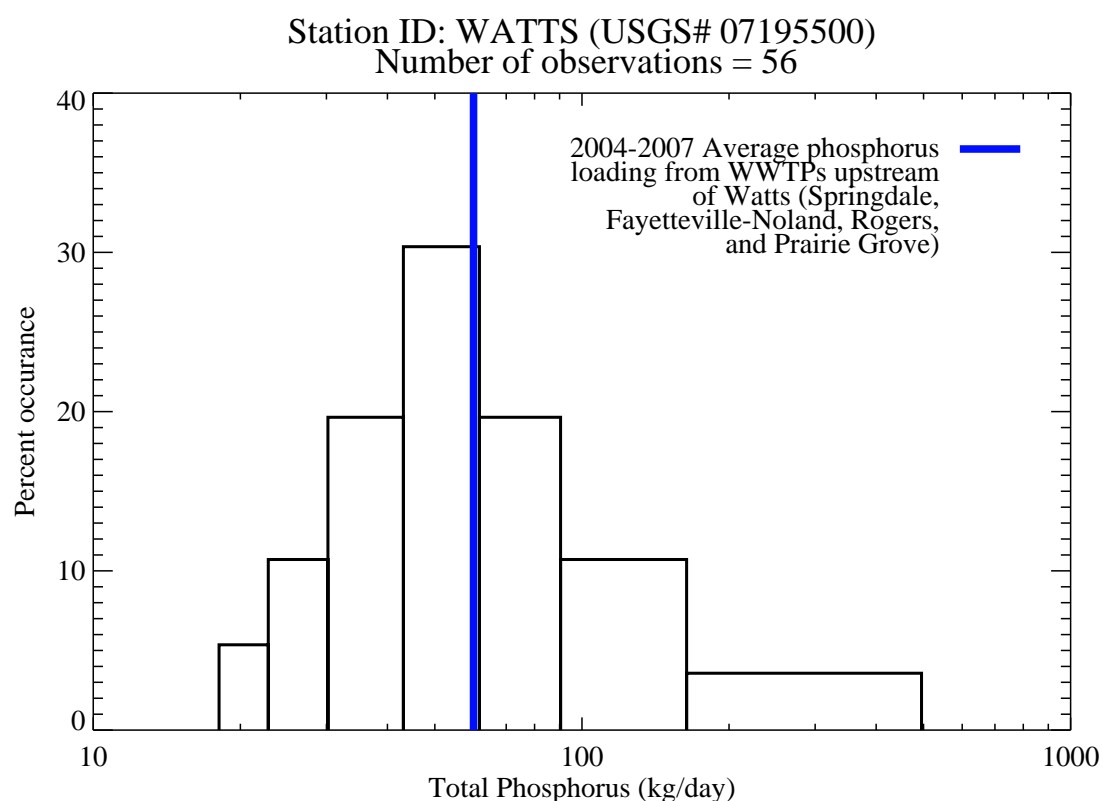


Figure 2-30. Frequency of calculated loads for total phosphorus under base flow condition, 2004-2007.

WWTP loads from Jarman 2008.

River loads calculated for days that had measured flow (USGS) and phosphorus concentration data (Plaintiff's data collected 2005-2007, OWRB, ADEQ and USGS).

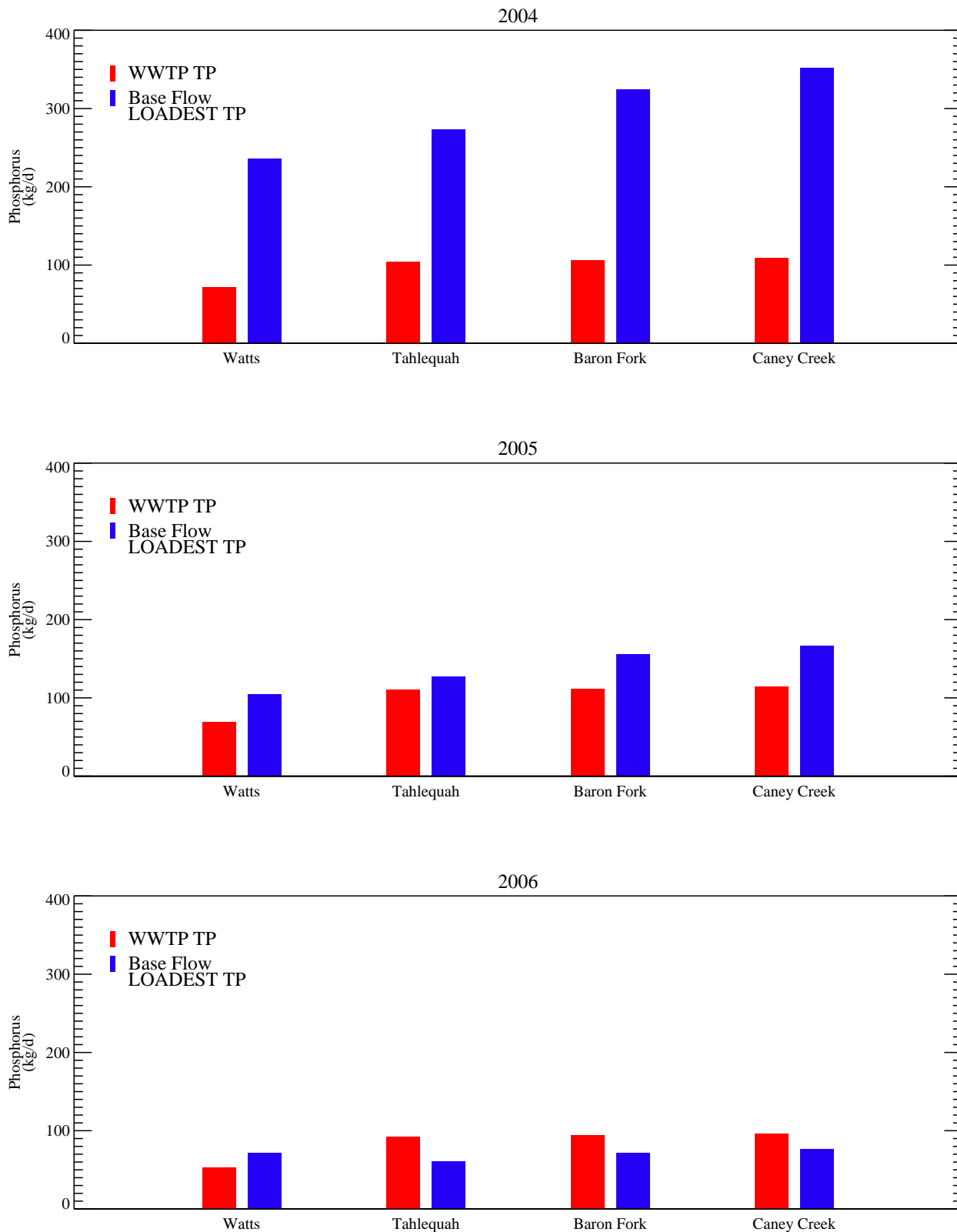


Figure 2-31. Average daily phosphorus loads along Illinois River.

Locations: USGS stations at Watts and Tahlequah; points of confluence of Baron Fork and Caney Creek with Illinois River. Values plotted at each location are cumulative loads till that point on the river. LOADEST calibrated for 2004-2008. Data sources in text.

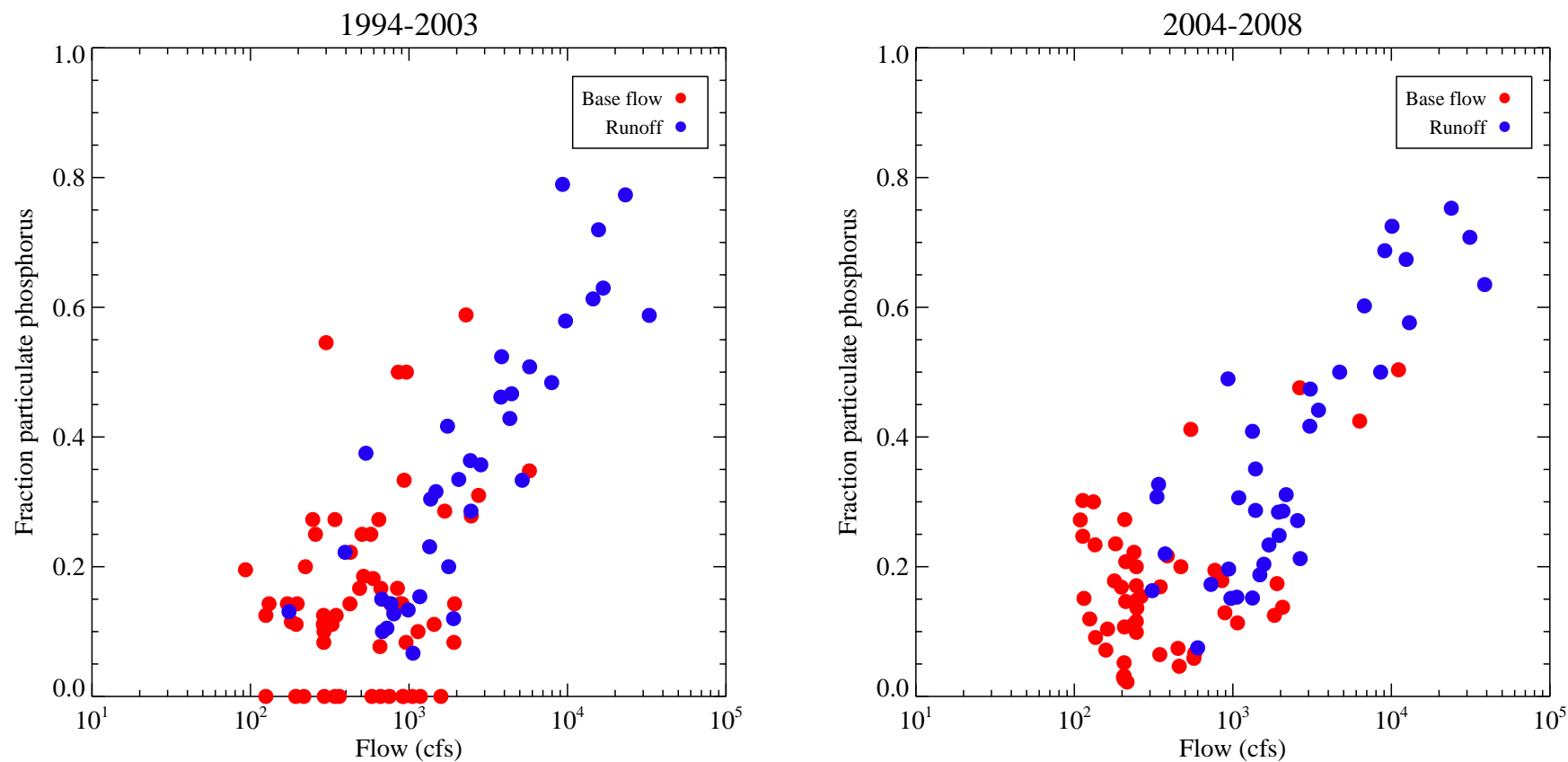


Figure 2-32. Fraction particulate phosphorus as a function of flow at Tahlequah.
Data: Plaintiff's Database 2004-2008, USGS 1994-2008.

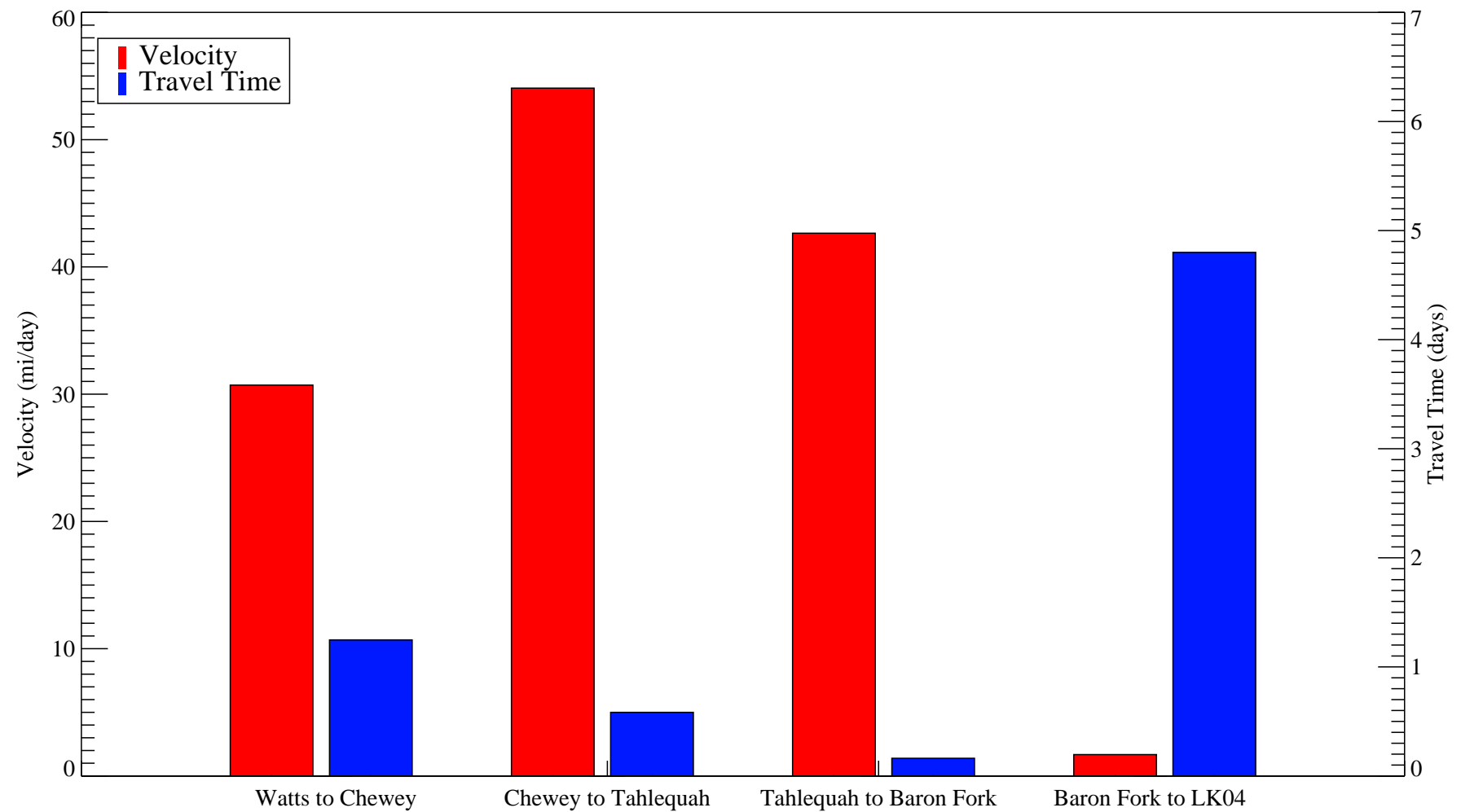
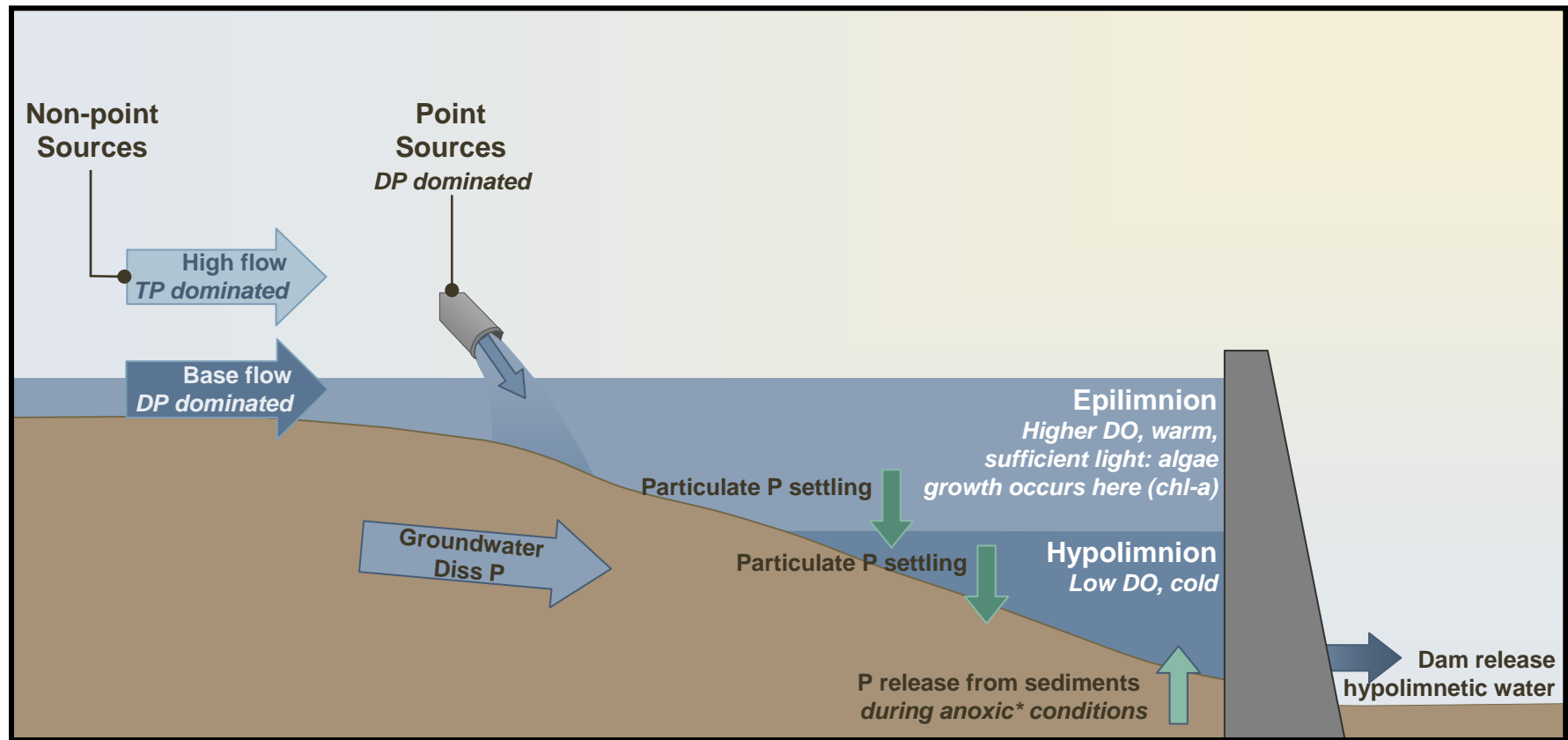


Figure 2-33. Travel times and velocities along the Illinois River under average summer flows conditions.
Data: USGS, Google Maps, GIS: 2004 and 2005 ESRI Data & Maps.



* Anoxic = no DO in the water

Figure 2-34. Schematic of reservoir phosphorus sources and summer-time stratification.